REMARKS

Claims 1-4, 6, 7 and 9-42 were rejected under 35 U.S.C. 103(a) as being unpatentable over Ehrlich et al. ('904) in view of van Der Wal et al. ('445) and Mao ('572). This rejection is respectfully traversed by the current amendment and the arguments presented below. The Examiner is requested to reconsider the rejection and allow the amended claims.

The claims have been amended to show that a minor amount (2 to 25 parts by weight) of the polyether co-polyol is used with the major amount of the polyester polyol. Also, the claims have been amended to show that a minor amount (2 to 25 moles) of the co-chain extender is used with the major amount of the symmetrical chain extender. The claims were also limited to the polyisocyanate being a diisocyanate. The ratio of the molar percent of the co-chain extender to the weight percent of the co-polyol was also narrowed to a more preferred range. The comparative experments in the Examples show the unexpected nature of the thermoplastic polyurethane made according to the amended claims.

The reference Ehrlich et al. ('904) teaches a polyurethane made from a diisocyanate (MDI), a polymeric diol (polyol) and an extender (chain extender), with equivalent proportions of the polyol to chain extender within the range of 1:2 to 1:20. Ehrlich et al.'s improvement is to replace at least 15 wt.% of the polyol with a polyoxypropylene-polyoxyethylene glycol or triol (2^{nd} polyol). The polyurethane of Ehrlich et al. are designed for injection molding applications (ski boots and the like). Ehrlich et al. states that at least 15 wt.% of the polyol can be replaced with a triol (a trifunctional polyol). The triol would cause the polyurethane to crosslink and might be suitable for injection molding but would be unacceptable for calendaring and extruded film application. Ehrlich et al. also requires a certain level of ethylene oxide to be present in the polyol portion.

As noted by the Examiner, Ehrlich et al. does not mention using polyoxytetramethylene polyols and the use of thermoplastic polyurethanes for coated fabrics and conveyor belts.

The reference van Der Wal et al. ('445) discloses a thermoplastic polyurethane which has a mixture of large amount of a polyester polyol with a small amount of polyether polyol. The preferred polyether polyol used by van Der Wal et al. is poly(tetramethylene ether) glycol. Van Der Wal et al. does not teach that one needs not only a mixture of polyols (polyester + polyether) but also a mixture of chain extender (a symmetrical and an asymmetric or different chain length).

The reference Mao ('572) teaches a thermoplastic polyurethane made from (a) poly(oxypropylene)-poly(oxyethylene) polyol; (b) polyester polyol; (c) polyisocyanate; and (d) low molecular chain extender. Mao does not mention the use of poly(tetramethylene ether) glycol as a polyether polyol. Mao also does not teach that there needs to be a mixture of the chain extenders (a symmetrical and an asymmetric or different chain length).

In the present invention, the objective is to make a TPU which can be processed fast and with good control of thickness in coated fabric applications, such as conveyor belt manufacture. Applicants have determined that to achieve this objective, the thermoplastic polyurethane needs to have slow annealing, low sensitivity of the complex viscosity to changes in shear rates, reduced crystallinity, and good hydrolytic resistance in the final product. To arrive at a combination of all of these properties, Applicant invented a thermoplastic polyurethane which is made with a mixture of polyols (a polyester and poly(tetramethylene ether glycol), which is a polyether polyol). Also a blend of chain extenders is required. One chain extender must be symmetrical while the second chain extender must be asymmetric or of a different chain length. The Applicants unexpectedly found that this combination of reactants, when used in the proportions recited in the claims will achieve all of the objectives desired.

The combination of the references Ehrlich et al. ('904), van Der Wal et al. ('445), and Mao (572) does not teach the specific thermoplastic polyurethane recited in Applicant's claims. Ehrlich et al. does not teach poly(tetramethylene ether glycol) as the polyol. Van Der Wal et al. while teaching poly(tetramethylene ether glycol) does not teach that one needs a mixture of the two types of chain extenders as claimed by Applicants. Mao, like Ehrlich et al. does not teach

poly(tetramethylene ether glycol) as the polyether polyol nor a mixture of the specific chain extenders recited in Applicants' claims.

Both of the co-inventors of the present application were employees of the Assignee at the time the invention was made and both had an obligation to assign the invention to Assignee. Both inventors are still employees of Assignee.

It is submitted that the present claims are unobvious over the teachings of Ehrlich et al. in view of van Der Wal et al. and Mao. The Examiner is respectfully required to reconsider and allow the amended claims.

Respectfully submitted,

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